

CARDS

GV1239

AND OTHER

A3P5

CARDS OF AMUSEMENT,

With full explanations and illustrations of  
their construction.

BY GEO. R. PERKINS, LL.D.

UTICA, N. Y.:

D. P. WHITE, PRINTER, 171 GENESEE STREET

1866.

N<sup>o</sup> 350

Ent<sup>d</sup>. March 26

Depos<sup>d</sup>. October 15.

# AGE CARDS,

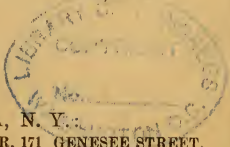
AND OTHER

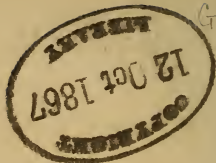
## CARDS OF AMUSEMENT,

WITH FULL EXPLANATIONS AND ILLUSTRATIONS  
OF THEIR CONSTRUCTION.

*15-18-5*  
*cards*  
BY GEO. R. PERKINS, LL.D.

UTICA, N. Y.:  
D. P. WHITE, PRINTER, 171 GENESEE STREET.  
1866.





## PREFACE.

The following pages are the result of a few leisure moments given to the preparation of cards for the amusement of some of my friends. As I progressed in my investigations my own interest became increased and I finally concluded to give my results a permanent form, by securing the copyright. And I intend soon to take measures for securing the patent right for the construction and use of all the various cards which I have described and referred to, especially those which I have denominated the Perforated Cards.

Utica, May 3, 1866.      GEO. R. PERKINS.

35106

Entered according to Act of Congress in the year 1866,

BY GEORGE R. PERKINS, LL. D.,

the Clerk's Office of the Northern District of the  
State of New York.

No. 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

## AGE CARDS.

All numbers in the natural series may be produced by the combination of the terms of the geometrical progression, 1, 2, 4, 8, 16, 32, 64, &c., by addition as follows:

### CASE I.

1=1	24=16+8
2=2	25=16+8+1
3=2+1	26=16+8+2
4=4	27=16+8+2+1
5=4+1	28=16+8+4
6=4+2	29=16+8+4+1
7=4+2+1	30=16+8+4+2
8=8	31=16+8+4+2+1
9=8+1	32=32
10=8+2	33=32+1
11=8+2+1	34=32+2
12=8+4	35=32+2+1
13=8+4+1	36=32+4
14=8+4+2	37=32+4+1
15=8+4+2+1	38=32+4+2
16=16	39=32+4+2+1
17=16+1	40=32+8
18=16+2	41=32+8+1
19=16+2+1	42=32+8+2
20=16+4	43=32+8+2+1
21=16+4+1	44=32+8+4
22=16+4+2	45=32+8+4+1
23=16+4+2+1	&c., &c.

The natural series of numbers may also be produced by the combination of the terms of the geometrical progression, 1, 3, 9, 27, 81, &c., by addition and subtraction, as follows:

### CASE II.

1=1	28=27+1
2=3-1	29=27+3-1
3=3	30=27+3
4=3+1	31=27+3+1
5=9-3-1	32=27+9-3-1
6=9-3	33=27+9-3
7=9-3+1	34=27+9-3+1
8=9-1	35=27+9-1
9=9	36=27+9
10=9+1	37=27+9+1
11=9+3-1	38=27+9+3-1
12=9+3	39=27+9+3
13=9+3+1	40=27+9+3+1
14=27-9-3-1	41=81-27-9-3-1
15=27-9-3	42=81-27-9-3
16=27-9-3+1	43=81-27-9-3+1
17=27-9-1	44=81-27-9-1
18=27-9	45=81-27-9
19=27-9+1	46=81-27-9+1
20=27-9+3-1	47=81-27-9+3-1
21=27-9+3	48=81-27-9+3
22=27-9+3+1	49=81-27-9+3+1
23=27-3-1	50=81-27-3-1
24=27-3	51=81-27-3
25=27-3+1	52=81-27-3+1
26=27-1	53=81-27-1
27=27	&c., &c.

These numbers may also be produced by addition and subtraction of the terms of the series, 1, 3, 5, 19, 57, 171, &c.

This series is partly arithmetical and partly geometrical; the first three terms 1, 3, 5 are in arithmetical progression, the succeeding terms 19, 57, 171, &c., are in geometrical progression. Using these terms we have as follows:

### CASE III.

1=1	23=19+3+1
2=3-1	24=19+5
3=3	25=19+5+1
4=3+1	26=19+5+3-1
5=5	27=19+5+3
6=5+1	28=19+5+3+1
7=5+3-1	29=57-19-5-3-1
8=5+3	30=57-19-5-3
9=5+3+1	31=57-19-5-3+1
10=19-5-3-1	32=57-19-5-1
11=19-5-3	33=57-19-5
12=19-5-3+1	34=57-19-5+1
13=19-5-1	35=57-19-3
14=19-5	36=57-19-3+1
15=19-5+1	37=57-19-1
16=19-3	38=57-19
17=19-3+1	39=57-19+1
18=19-1	40=57-19+3-1
19=19	41=57-19+3
20=19+1	42=57-19+3+1
21=19+3-1	43=57-19+5
22=19+3	&c., &c

These numbers may also be produced by using the terms of the following series, 1, 3, 5, 10, 20, 40, &c., which is partly arithmetical and partly geometrical, in this case, however, the only term to be subtracted is 1, as follows:

### CASE IV.

1=1	27=20+5+3-1
2=3-1	28=20+5+3
3=3	29=20+5+3+1
4=3+1	30=20+10
5=5	31=20+10+1
6=5+1	32=20+10+3-1
7=5+3-1	33=20+10+3
8=5+3	34=20+10+3+1
9=5+3+1	35=20+10+5
10=10	36=20+10+5+1
11=10+1	37=20+10+5+3-1
12=10+3-1	38=20+10+5+3
13=10+3	39=20+10+5+3+1
14=10+3+1	40=40
15=10+5	41=40+1
16=10+5+1	42=40+3-1
17=10+5+3-1	43=40+3
18=10+5+3	44=40+3+1
19=10+5+3+1	45=40+5
20=20	46=40+5+1
21=20+1	47=40+5+3-1
22=20+3-1	48=40+5+3
23=20+3	49=40+5+3+1
24=20+3+1	50=40+10
25=20+5	51=40+10+1
26=20+5+1	&c., &c.



The natural series of numbers may also be produced by the addition and subtraction of other chosen terms, but at the present time we propose to confine ourselves to the four cases here exhibited.

### CASE I.

Arranging the numbers according to the elements used in their formation, that is, we group all those numbers together which are formed by the aid of 1, all those formed by the aid of 2, all those formed by 4, &c., as follows:

(A)	(B)	(C)	(D)	(E)
1	2	4	8	16
3	3	5	9	17
5	6	6	10	18
7	7	7	11	19
9	10	12	12	20
11	11	13	13	21
13	14	14	14	22
15	15	15	15	23
17	18	20	24	24
19	19	21	25	25
21	22	22	26	26
23	23	23	27	27
25	26	28	28	28
27	27	29	29	29
29	30	30	30	30
31	31	31	31	31

These groups designated by the letters A, B, C, D, E, &c., possess the following property:

Any number which is found in any one or more of these groups, and not in any of the other groups, is obtained by adding the leading or first numbers in the groups. As examples:

The number in groups *A* and *D* and not in either of the other groups, is  $1+8=9$ .

The number in groups *A*, *C* and *E*, is  $1+4+16=21$ ; and in like manner for other numbers.

Hence, knowing that a particular number is only in one or more of these groups, we at once know the number.

The above groups when arranged on separate pieces of paper or cards, have been known and published as *Age Cards*. They usually consist of seven cards, whose leading numbers are 1, 2, 4, 8, 16, 32 and 64, and embrace all the series of natural numbers up to 127.

A person being asked to select such of the cards as contain the number of years denoting his age, you at once determine this number by adding the top numbers of the selected cards.

## CASE II.

Arranging our groups, or cards, according to the elements, 1, 3, 9, 27, 81, &c., observing to make a distinct and separate grouping for the negative values of these terms, which we have indicated by the small letters *a*, *b*, *c*, *d*, &c., as follows:

				$[-1]$	$[-3]$	$[-9]$
(A)	(B)	(C)	(D)	(a)	(b)	(c)
[ 1]	2	5	14	2	5	14
4	[ 3]	6	15	5	6	15
7	4	7	16	8	7	16
10	11	8	17	11	14	17
13	12	[ 9]	18	14	15	18
16	13	10	19	17	16	19
19	20	11	20	20	23	20
22	21	12	21	23	24	21
25	22	13	22	26	25	22
28	29	32	23	29	32	
31	30	33	24	32	33	
34	31	34	25	35	34	
37	38	35	26	38		
40	39	36	[27]			
	40	37	28			
		38	29			
		39	30			
		40	31			
			32			
			33			
			34			
			35			
			36			
			37			
			38			
			39			
			40			

To determine in this case the number on the selected cards, we must *add* the numbers on the cards denoted by the capital letters, which are included in the brackets—[ ]—and from the sum subtract the numbers on the cards denoted by the small letters which are in the brackets immediately over the letters. *Examples:* Suppose the selected cards to be *A*, *B* and *D*, the number will be  $1+3+27=31$ . If the cards are *D*, *a* and *c*, the number will be  $27-1-9=17$ . If the cards are *B*, *C*, *D* and *a*, the number will be  $3+9+27-1=38$ ; and in a similar way for other cases.

By the introduction of two additional cards denoted by (E) and (d) whose values are +81 and -27, we shall embrace all numbers up to 121.

These nine cards, with a card of explanation, are given on the last pages of this book, two cards being printed on each page, so that they may be readily cut out and used as a *Puzzle*, independent of the other matter.

In a similar way cards may be formed for the other cases here given.

### CASE III.

Arranging our numbers according to the elements 1, 3, 5, 19, 57, &c., distinguishing the negative values from the positive as in the preceding case, we have

(A)	(B)	(C)	(D)	$[-1]$ (a)	$[-3]$ (b)	$[-5]$ (c)
[ 1]	2	[ 5]	10	2	10	10
4	[ 3]	6	11	7	11	11
6	4	7	12	10	12	12
9	7	8	13	13	16	13
12	8	9	14	18	17	14
15	9	24	15	21		15
17	21	25	16	26		
20	22	26	17			
23	23	27	18			
25	26	28	[19]			
28	27		20			
	28		21			
			22			
			23			
			24			
			25			
			26			
			27			
			28			

In this case, if the selected cards are  $A$ ,  $D$  and  $c$ , the number is  $1+19-5=15$ ; if the cards are  $D$ ,  $a$ ,  $b$  and  $c$ , the number is  $19-1-3-5=10$ ; and so for other combination of cards.

By the introduction of two cards ( $E$ ) and ( $d$ ), whose values are  $+57$  and  $-19$ , we shall embrace all numbers up to 85.

## CASE IV.

Proceeding as in the preceding cases we find:

					$[-1]$
(A)	(B)	(C)	(D)	(E)	(a)
[ 1]	2	[ 5]	[10]	[20]	2
4	[ 3]	6	11	21	7
6	4	7	12	22	12
9	7	8	13	23	17
11	8	9	14	24	22
14	9	15	15	25	27
16	12	16	16	26	32
19	13	17	17	27	37
21	14	18	18	28	
24	17	19	19	29	
26	18	25	30	30	
29	19	26	31	31	
31	22	27	32	32	
34	23	28	33	33	
36	24	29	34	34	
39	27	35	35	35	
	28	36	36	36	
	29	37	37	37	
	32	38	38	38	
	33	39	39	39	
	34				
	37				
	38				
	39				

If the selected cards are in this case  $B$ ,  $C$  and  $a$ , we have for the number  $3+5-1=7$ , if the cards are  $C$ ,  $D$  and  $a$ , we have  $5+10-1=14$ , and similarly for other combination of cards.

Introducing another positive card ( $F$ ) whose value is 40, we shall embrace all numbers up to 79. In this case, however far we extend our numbers, there will be but one negative card ( $a$ ) whose value is  $-1$ .

So far as I am aware, cases II, III and IV, which require subtraction as well as addition, have never before been noticed. Case I, is on many accounts the most interesting, it will embrace more numbers, with fewer cards than in either of the other cases. But as a *Puzzle* to those not in the secret of the arrangement of the groups of terms, case II is the most remarkable. For, if we omit the letters and the brackets, which we have employed to assist in their explanation, and write simply the numbers, we shall have a set of cards, which would afford considerable amusement.

It is obvious that we might employ instead of these numbers, individual names of things, as the names of distinguished persons, localities, or events, having each individual numbered, so that the particular name selected on any card may be readily determined by means of its corresponding number.

The following list of the names of 121 Poets are thus arranged alphabetically, and each individual is denoted by the appropriate number as here given:

In this case we have five *positive cards*, denoted by the capital letters *A, B, C, D* and *E*, having the corresponding values 1, 3, 9, 27 and 81; and four *negative cards*, denoted by the small letters *a, b, c* and *d*, and having the corresponding negative values of  $-1$ ,  $-3$ ,  $-9$  and  $-27$ .

These nine cards with the *Key Card*, are correctly arranged and given on the following pages in such a manner as to admit of being cut out and pasted upon card paper so as to save the labor of copying them with the pen.

If an individual is requested to select such cards as contain the name of his favorite Poet, and he should return the cards denoted by *A, C*, and *E*, we should at once have by adding the values of these cards  $1+9+81=91$ , then referring to our *Key Card*, we see that *Read* corresponds to the number 91. Had he returned us the cards *A, E* and *d*, we should have found  $1+81-27=55$  which corresponds to *Horace*.

Similarly, the cards *D, E, b* and *c*, give  $27+81-3-9=96$ , corresponds to *Shakespeare*. The cards *B, E* and *c*, give  $3+81-9=75$ , corresponding to *Milton*.



## KEY CARD.

- |                   |                   |                  |
|-------------------|-------------------|------------------|
| 1. Addison.       | 42. Gilman.       | 83. Pierpont.    |
| 2. Akenside.      | 43. Glen.         | 84. Poe.         |
| 3. Aldrich.       | 44. Goethe.       | 85. Pollok.      |
| 4. St. Ambrose.   | 45. Goldsmith.    | 86. Pope.        |
| 5. Anacreon.      | 46. Gray.         | 87. Prentiss.    |
| 6. Angelo.        | 47. Heber.        | 88. Quarles.     |
| 7. Baillie.       | 48. Hemans.       | 89. Raleigh.     |
| 8. Barbauld.      | 49. Herbert.      | 90. Ramsey.      |
| 9. Baxter.        | 50. Herrick.      | 91. Read.        |
| 10. Beattie.      | 51. Hogg.         | 92. Rogers.      |
| 11. Beaumont.     | 52. Holmes.       | 93. Roscoe.      |
| 12. Blake.        | 53. Homer.        | 94. Sappho.      |
| 13. Bowles.       | 54. Hood.         | 95. Scott.       |
| 14. Browning.     | 55. Horace.       | 96. Shakespeare. |
| 15. Burns.        | 56. Howitt.       | 97. Shelly.      |
| 16. Butler.       | 57. Hugo.         | 98. Shenstone.   |
| 17. Byron.        | 58. Hunt.         | 99. Southey.     |
| 18. Callistratus. | 59. Ingram.       | 100. Spencer.    |
| 19. Chatterton.   | 60. Sam. Johnson. | 101. Street.     |
| 20. Chaucer.      | 61. Ben. Jonson.  | 102. Suckling.   |
| 21. Coleridge.    | 62. Keats.        | 103. Swift.      |
| 22. Collins.      | 63. Keble.        | 104. Taylor.     |
| 23. Cornwall.     | 64. Kemble.       | 105. Tennyson.   |
| 24. Cowley.       | 65. Kingsley.     | 106. Terry.      |
| 25. Cowper.       | 66. Lamb.         | 107. Thackeray.  |
| 26. Crabbe.       | 67. Landor.       | 108. Thomson.    |
| 27. Croly.        | 68. Leonidas.     | 109. Tuckerman.  |
| 28. Cunningham.   | 69. Longfellow.   | 110. Uhland.     |
| 29. Daniel.       | 70. Lover.        | 111. Vaughn.     |
| 30. Davidson.     | 71. Lowell.       | 112. Virgil.     |
| 31. Dickens.      | 72. Luther.       | 113. Watts.      |
| 32. Doddridge.    | 73. Macaulay.     | 114. Wesley.     |
| 33. Drake.        | 74. Marvell.      | 115. White.      |
| 34. Dryden.       | 75. Milton.       | 116. Whittier.   |
| 35. Eastman.      | 76. Montgomery.   | 117. Willis.     |
| 36. Elliott.      | 77. Moore.        | 118. Wilson.     |
| 37. Emerson.      | 78. Motherwell.   | 119. Wordsworth. |
| 38. Ferguson.     | 79. Newton.       | 120. Young.      |
| 39. Fletcher.     | 80. Norton.       | 121. Zedlitz.    |
| 40. Fortunatus.   | 81. Ogilvie.      |                  |
| 41. Gay.          | 82. Percival.     |                  |

## (A)

Addison,	Glen,	Pollok,
St. Ambrose,	Gray,	Quarles,
Baillie,	Herbert,	Read,
Beattie,	Holmes,	Sappho,
Bowles,	Horace,	Shelly,
Butler,	Hunt,	Spencer,
Chatterton,	Ben. Jonson,	Swift,
Collins,	Kemble,	Terry,
Cowper,	Landor,	Tuckerman,
Cunningham,	Lover,	Virgil,
Dickens,	Macaulay,	White,
Dryden,	Montgomery,	Wilson,
Emerson,	Newton,	Zedlitz.
Fortunatus,	Percival,	

## (a)

Akenside,	Goethe,	Pope,
Anacreon,	Heber,	Raleigh,
Barbault,	Herrick,	Rogers,
Beaumont,	Homer,	Scott,
Browning,	Howitt,	Shenstone,
Byron,	Ingram,	Street,
Chaucer,	Keats,	Taylor,
Cornwall,	Kingsley,	Thackeray,
Crabbe,	Leonidas,	Uhland,
Daniel,	Lowell,	Watts,
Doddridge,	Marvell,	Whittier,
Eastman,	Moore,	Wordsworth.
Ferguson,	Norton,	
Gay,	Pierpont,	

## (B)

Akonside,	Fortunatus,	Poe,
Aldrich,	Heber,	Pollok,
St. Ambrose,	Hemans,	Rogers,
Beaumont,	Herbert,	Roscoe,
Blake,	Howitt,	Sappho,
Bowles,	Hugo,	Street,
Chaucer,	Hunt,	Suckling,
Coleridge,	Kingsley,	Swift,
Collins,	Lamb,	Uhland,
Daniel,	Landor,	Vaughn,
Davidson,,	Marvell,	Virgil,
Dickens,	Milton,,	Wordsworth,
Ferguson,	Montgomery,	Young,
Fletcher,	Pierpont,	Zedlitz.

## (b)

Anacreon,	Gilman,	Newton,
Angelo,	Glen,	Pope,
Baillie,	Herrick,	Prentiss,
Browning,	Hogg,	Quarles,
Burns,	Holmes,	Scott,
Butler,	Ingram,	Shakespeare,
Cornwall,	Sam. Johnson,	Shelly,
Cowley,	Ben. Jonson,	Taylor,
Cowper,	Leonidas,	Tennyson,
Doddridge,	Longfellow,	Terry,
Drake,	Lover,	Watts,
Dryden,	Moore,	Wesley,
Gay,	Motherwell,	White.

## (C)

Anacreon,	Ferguson,	Raleigh,
Angelo,	Fletcher,	Ramsey,
Baillie,	Fortunatus,	Read,
Barbault,	Ingram,	Rogers,
Baxter.	Sam. Johnson,	Roscoe,
Beattie,	Ben. Jonson,	Sappho,
Beaumont,	Keats,	Watts,
Blake,	Keble,	Wesley,
Bowles,	Kemble,	White,
Doddridge,	Kingsley,	Whittier,
Drake,	Lamb,	Willis,
Dryden,	Landor,	Wilson,
Eastman,	Pope,	Wordsworth,
Elliott,	Prentiss,	Young,
Emerson,	Quarles,	Zedlitz.

## (c)

Browning,	Goethe,	Marvell,
Burns,	Goldsmith,	Milton,
Butler,	Gray,	Montgomery,
Byron,	Heber,	Scott,
Callistratus,	Hemans,	Shakespeare,
Chatterton,	Herbert,	Shelly,
Chaucer,	Leonidas,	Shenstone,
Coleridge,	Longfellow,	Southey,
Collins,	Lover,	Spencer,
Gay,	Lowell,	Street,
Gilman.	Luther,	Suckling,
Glen,	Macaulay,	Swift.

## (D)

Browning,	Doddridge,	Taylor,
Burns,	Drake,	Tennyson,
Butler,	Dryden,	Terry,
Byron,	Eastman,	Thackeray,
Calistratus,	Elliott,	Thomson,
Chatterton.	Emerson,	Tuckerman,
Chaucer,	Ferguson,	Uhland,
Coleridge,	Fletcher,	Vaughn,
Collins,	Fortunatus,	Virgil,
Cornwall,	Scott,	Watts,
Cowley,	Shakespeare,	Wesley,
Cowper,	Shelly,	White,
Crabbe,	Shenstone,	Whittier,
Croly,	Southey,	Willis,
Cunningham,	Spencer,	Wilson,
Daniel,	Street,	Wordsworth,
Davidson,	Suckling,	Young,
Dickens,	Swift,	Zedlitz.

## (d)

Gay,	Herrick,	Ingram,
Gilman,	Hogg,	Sam. Johnson,
Glen,	Holmes,	Ben. Jonson,
Goethe,	Homer,	Keats,
Goldsmith,	Hood,	Keble,
Gray,	Horace,	Kemble,
Heber,	Howitt,	Kingsley,
Hemans,	Hugo,	Lamb,
Herbert,	Hunt,	Landor,

## (E)

Gay,	Leonidas,	Scott,
Gilman,	Longfellow,	Shakespeare,
Glen,	Lover,	Shelley,
Goethe,	Lowell,	Shenstone,
Goldsmith,	Luther,	Southey,
Gray,	Macaulay,	Spencer,
Heber,	Marvell,	Street,
Hemans,	Milton,	Suckling,
Herbert,	Montgomery,	Swift,
Herrick,	Moore,	Taylor,
Hogg,	Motherwell,	Tennyson,
Holmes,	Newton,	Terry,
Homer,	Norton,	Thackeray,
Hood,	Ogilvie,	Thomson,
Horace,	Percival,	Tuckerman,
Howitt,	Pierpont,	Uhland,
Hugo,	Poe,	Vaughn,
Hunt,	Pollok,	Virgil,
Ingram,	Pope,	Watts,
Sam. Johnson,	Prentiss,	Wesley,
Ben. Jonson,	Quarles,	White,
Keats,	Raleigh,	Whittier,
Keble,	Ramsey,	Willis,
Kemble,	Read,	Wilson,
Kingsley,	Rogers,	Wordsworth,
Lamb,	Roscoe,	Young,
Landor,	Sappho,	Zedlitz.

I will give the following curious mechanical method of performing the addition and subtraction of the terms of the geometrical progression 1, 3, 9, 27, 81, without mental effort.

Prepare 18 square cards of 121 cells each, that is of 11 rows of 11 cells in each row, and locate the 121 numbers in these cells, in numerical order, or in any other order we please, but the same order of location must be observed for the 18 cards.

Cut out the numbers on one of these squares which are given on the card *A*, and denote the square card thus cut or perforated by *AA*. Also make its complimentary perforated card from one of our 18 cards, by cutting out all the numbers except those given on *A*, and call the resulting card *AAA*. Similarly, cut out from another of our 18 cards, such numbers as are found on the card *a*, and call the result *aa*, also form its complementary card denoted by *aaa*, by cutting out from one of our 18 cards, all the numbers except those on the card *a*. Proceed in the same way to form the card *BB*, and its complementary card *BBB*; also, *bb* and *bbb*; also, *CC* and *CCC*; also, *cc* and *ccc*; also, *DD* and *DDD*; also, *dd* and *ddd*; also, *EE* and *EEE*.

We shall thus obtain 9 new perforated cards denoted by *AA*, *aa*, *BB*, *bb*, *CC*, *cc*, *DD*, *dd*, *EE*, and their 9 corresponding complementary cards *AAA*, *aaa*, *BBB*, *bbb*, *CCC*, *ccc*, *DDD*, *ddd*, *EEE*.

Now if a number is selected which is on the cards *A*, *B*, *c*, and *d*, and not on any of the other

cards, we take of the perforated cards, the cards *AA*, *BB*, *cc*, *dd*, and the complementary cards *aaa*, *bbb*, *CCC*, *DDD*, *EEE*, and placing them together in any order, we have a pack of 9 perforated cards, and we shall find one and only one perforation extending entirely through the pack, and this corresponds with the number sought, and by placing our pack upon a square card which has none of its numbers cut out, the number sought will be revealed through this perforation.

Since by this arrangement, we never superimpose any card on its complementary card, we may combine our 18 perforated cards so as to have only 9 distinct cards, the upper and lower halves of each card being complementary to each other; and adding to these 9 cards, the corresponding cards denoted by *A*, *a*, *B*, *b*, *C*, *c*, *D*, *d* and *E*, we shall have, including the Key Card which contains all the numbers and is not perforated, 10 cards. Each example may be performed by placing the 9 cards together upon the Key Card. The only thing to be careful to observe is to turn over, face downwards, such cards as do not contain the number under consideration.

Such perforated cards would obviously form considerable amusement when exhibited for the first time.



(A)		(a)	
1	64	2	62
4	67	5	65
7	70	8	68
10	73	11	71
13	76	14	74
16	79	17	77
19	82	20	80
22	85	23	83
25	88	26	86
28	91	29	89
31	94	32	92
34	97	35	95
37	100	38	98
40	103	41	101
43	106	44	104
46	109	47	107
49	112	50	110
52	115	53	113
55	118	56	116
58	121	59	119
61			



(B)		(b)	
2	65	5	61
3	66	6	68
4	67	7	69
11	74	14	70
12	75	15	77
13	76	16	78
20	83	23	79
21	84	24	86
22	85	25	87
29	92	32	88
30	93	33	95
31	94	34	96
38	101	41	97
39	102	42	104
40	103	43	105
47	110	50	106
48	111	51	113
49	112	52	114
56	119	59	115
57	120	60	
58	121		



(C)

5	64
6	65
7	66
8	67
9	86
10	87
11	88
12	89
13	90
32	91
33	92
34	93
35	94
36	113
37	114
38	115
39	116
40	117
59	118
60	119
61	120
62	121
63	

(c)

14	68
15	69
16	70
17	71
18	72
19	73
20	74
21	75
22	76
41	95
42	96
43	97
44	98
45	99
46	100
47	101
48	102
49	103



(D)		(d)	
14	95	41	54
15	96	42	55
16	97	43	56
17	98	44	57
18	99	45	58
19	100	46	59
20	101	47	60
21	102	48	61
22	103	49	62
23	104	50	63
24	105	51	64
25	106	52	65
26	107	53	66
27	108		67
28	109		
29	110		
30	111		
31	112		
32	113		
33	114		
34	115		
35	116		
36	117		
37	118		
38	119		
39	120		
40	121		





(E)

41	61	81	101
42	62	82	102
43	63	83	103
44	64	84	104
45	65	85	105
46	66	86	106
47	67	87	107
48	68	88	108
49	69	89	109
50	70	90	110
51	71	91	111
52	72	92	112
53	73	93	113
54	74	94	114
55	75	95	115
56	76	96	116
57	77	97	117
58	78	98	118
59	78	99	119
60	80	100	120
			121

**EXPLANATION.**

The five cards denoted by the capital letters *A*, *B*, *C*, *D* and *E* all end with the number 121, and the value of each is *positive* and requires to be added. These values are as follows:

$A=1$ ;  $B=3$ ;  $C=9$ ;  
 $D=27$ ;  $E=81$ .

The four cards denoted by the small letters *a*, *b*, *c* and *d* are *negative*, and their values are to be subtracted. These values are as follows:

$a = -1$ ;  $b = -3$ ;  
 $c = -9$ ;  $d = -27$ .

**EXAMPLES.**

*A*, *B*, *C* give  
 $1+3+9=13$ :

*A*, *E*, *b* give  
 $1+81-3=79$ .

*B*, *D*, *a*, *c* give  
 $3+27-1-9=20$ .

*E*, *a*, *b*, *c*, *d* give  
 $81-1-3-9-27=41$





LIBRARY OF CONGRESS



0 029 604 600 0